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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/902,095 | 07/11/2001 | Richard Kirchofer | 017750-328 | 8095 |

7590 09/10/2003

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EXAMINER

ISSING, GREGORY C

ART UNIT

PAPER NUMBER

3662

DATE MAILED: 09/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/902,095

Applicant(s)

KIRCHOFER ET AL.

Examiner

Gregory C. Issing

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-73 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-73 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsiung in view of Greenspan.

3. Hsiung teach and apparatus and method for pointing a directional antenna from a mobile platform to a non-geostationary spacecraft including determining the location of the mobile platform using GPS signals, determining time, determining the attitude of the platform, and determining the location of the spacecraft. The azimuth and elevation pointing angle or direction relative to the mobile terminal are determined from the relative location of the platform and the spacecraft, and the pitch, roll, and yaw of the mobile platform, together with, if necessary, any difference between the orientation of the platform itself and the antenna mounting. The beam pointing is controlled by a beamformer when using an electronically scanned type antenna. Thus, Hsiung teaches the array 14 of antenna elements for receiving RF signals, a navigational processor 112 for determining an antenna pointing vector from determined coordinate data, and beamforming electronics 120 for forming reception lobes in the determined pointing vector directions. While Hsiung teaches receiving GPS signals and a beamformer controlled phased array antenna for pointing a directional beam toward an orbiting, non-geosynchronous spacecraft, Hsiung does not specify the array for directing the beam(s) toward a GPS satellite. Greenspan teaches the conventionality and desire of beamforming a GPS antenna array on the basis of inertial sensor data 18 and GPS location data so as to controllably and dynamically

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develop high gain profiles in the directions of the GPS satellites. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Hsiung by incorporating the phased array as a means of receiving signals from the non-geosynchronous satellites of the GPS constellation in view of the teachings of Greenspan and thereby selectively acquire transmissions from the desired GPS signals while effectively suppressing interference. The dependent claims are shown and/or would have been obvious design considerations for use in a GPS antenna and/or electronically scanned antenna arrays.

4. Claims 1-73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dixon in view of Greenspan.

5. Dixon teaches an antenna array for communicating with a satellite including a GPS satellite wherein the antenna array is controlled so as to directionally point the antenna in the direction of the satellite. The means for controlling the antenna array 203 includes knowledge of the position (603-605) of the antenna array as derived from received RF signals from GPS satellites and determined by GPS receiver 304, knowledge of the positions of the satellites (606), orientation sensing means 305 providing orientation data (602) and processing means 203 which is responsive to point the antenna (607). Dixon does not specifically address whether the antenna elements 302, 303 of Figure 3 are the antenna elements which receive the GPS signals from the satellites for processing in element 304 which is described as a GPS receiver for determining the position. Greenspan teaches the conventionality and desire of beamforming a GPS antenna array on the basis of inertial sensor data 18 and GPS location data so as to controllably and dynamically develop high gain profiles in the directions of the GPS satellites; the beamformer of Greenspan provides multiple beams directed to plural desired signal sources.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Dixon by incorporating the antenna array as a means of receiving signals from the satellites of the GPS constellation as well as any communication satellites in view of the teachings of Greenspan and thereby selectively acquire transmissions from the desired GPS signals for determining the location data while effectively suppressing interference. The dependent claims are shown and/or would have been obvious design considerations for use in a GPS antenna and/or electronically scanned antenna arrays.


6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Velazquez et al (6,512,481) disclose an apparatus and method for selectively receiving a radio frequency signal wherein an antenna array is controlled by a beamformer and the beamformer is controlled having knowledge of the position of the antenna array and the position of the target(s) to which the antenna is directing beam(s). Velzquez et al differ from the claimed subject matter only in the sense that the target is a base station and not specified as a GPS satellite. Yu discloses an antenna array for receiving GPS signals wherein a beam controller controls the steering of the main lobes as well as the placement of nulls in order to accurately track GPS satellites amidst jammers/interference. McDowell discloses a method and apparatus for reducing jamming by beamforming using navigational data.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory C. Issing whose telephone number is (703)-306-4156. The examiner can normally be reached on Mon-Thurs 6:30-5:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Tarcza can be reached on (703)-306-4171. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1113.


Gregory C. Issing
Primary Examiner
Art Unit 3662

gci